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HARTZELL

March 30, 2004

Docket Management Facility
U.S. Department of Transportation
400 Seventh Street, SW
Nassif Building
Room PL- 401
Washington, DC 20590-0001

Docket Number FAA-2004-17041 – 17

Subject: Docket No. FAA-2004-17041, Comments on Noise Stringency Increase for Single-Engine Propeller-Driven Small Airplanes

Hartzell Propeller would like to submit comments on the NPRM that proposes to reduce the certificated noise limits for single-engine propeller-driven small airplanes. Hartzell is a small, family-owned company with approximately 300 employees and our company has been in the business of designing and manufacturing aircraft propellers for the past 87 years. In that time we have supplied propellers to nearly all of the major manufacturers of personal, corporate and regional airline aircraft around the world. A part of our business also involves supplying propellers to aircraft modification companies who upgrade older aircraft with new propellers, often in conjunction with improved engine installations.

Hartzell also holds over 50 Supplemental Type Certificates (STCs) for installation of improved propellers on small airplanes, from which over 10,000 kits have been installed. In total, we have over 2,000 different aircraft/engine/propeller applications and at the present time we are involved with about 90 new propeller installation programs.

Based on the above industry involvement and experience we believe that the proposed rule should be clarified. Below are our comments grouped by NPRM section:

NPRM Background Section, Synopsis of the Proposal

The NPRM section (paragraph 5) says that the task group "*decided to propose new noise stringency levels that are at the noise levels of current production airplanes*" and that "*Raising the stringency to the level of current production guarantees that future designs do not generate greater noise levels than current production airplanes*".

In some recent STC projects involving propeller substitutions we have chosen to show noise compliance via no-acoustical-change findings. Attached is a letter from FAA Office of Environment and Energy dated September 14, 1990 that supports this policy. We propose that this policy be allowed to continue and that it be included in the final rule if and when it goes into effect.

The no-acoustical-change policy for propeller installations remains consistent with the NPRM (since it does not allow an increase in noise) and will continue to aid in the certification of lower-

noise propellers. Many STC programs involve the replacement of obsolete propellers for which new parts may not be available, and many of these aging aircraft are low-priced and are in small fleets making it marginally cost-effective to pursue an STC. Allowing noise compliance to be shown via a no-acoustical-change finding per the 1990 policy memorandum will keep the certification burden to a minimum and allow propellers with noise reduction features to be installed on a maximum number of existing aircraft. These propeller noise reduction features include thinner tip airfoils, swept tip planforms, increased blade count with reduced diameter, aerodynamic loading changes along the blade and so on. Installing the maximum number of propellers of newer design will help reduce the overall noise footprint of the GA fleet, which will benefit the public.

Most of these older (CAR 3 and early 14 CFR Part 23) aircraft were certificated and produced before the current, or in some cases any, noise regulations were in effect. These aircraft may not meet current or proposed noise levels. Forcing them to meet the new limit would not be consistent with the NPRM and may be counterproductive. There would likely be situations where no propeller installation could meet the new regulations without a significant degradation in performance (and safety) where it may be possible to install a new propeller that is quieter than the current propeller and has similar performance, though still be above the proposed noise level. In this case is it better for the public to have a louder propeller remain in service or to have a new one that is quieter than before but not meet the new noise limit? A number of seaplanes and utility aircraft would fall into this category, for example, many with the Teledyne Continental Motors (TCM) IO-520 engine rated at 2,850 takeoff RPM.

A number of the Hartzell STCs obtained with a no-acoustical-change finding have allowed smaller diameter three-blade propellers to be installed in place of longer diameter two-blade propellers. These propellers are noticeably quieter in most cases, though no credit is taken for any sound level reduction and the certificated noise level is unchanged (no louder). It will be desirable to generate a new certificated noise level in many cases, for example to increase sales prospects in Europe, to advertise a noise reduction for a particularly loud aircraft model, or simply because the installation does not fall within the current no-acoustical-change policy guidelines. Nothing would prohibit applicants from generating new certificated noise levels for their projects. But a no-acoustical-change finding for propeller installations should remain an option for FAA applicants for the reasons stated above.

Initial Regulatory Flexibility Determination

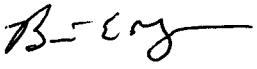
The fourth paragraph of this section says "*The FAA believes that very few, if any, small entities that apply for supplemental type certificate would be rejected as a result of the proposed rule, so small entities would incur minimal, if any, costs. The FAA also believes that no new type certificate applicant would fail the more stringent noise standard required by this proposed rule because airplanes in current production already meet the proposed standards. Thus, the FAA has determined that this proposed rule would not have a significant adverse economic impact on a substantial number of small entities...*". Provided that the no-acoustical-change policy is continued for propeller installations, we agree with the above section.

However, if it were not, a number of individuals and small businesses would definitely incur greater costs. A typical noise test for a small aircraft costs about $6,000 including engineering services and aircraft usage. If 50 additional tests were performed in the U.S. every year this would result an additional $300,000 burden to the small General Aviation businesses who obtain the majority of STCs. In addition, if aircraft with obsolete propellers were grounded because the best available new propellers could not meet the new noise regulations (and could not be approved via no-acoustical-change) with performance equivalent to the old propellers, the economic impact could be very large.

As an example, according to a recent check of the U.S. aircraft registry there were 14,406 aircraft with TCM IO-520 engines (mentioned earlier) in the fleet. If most of these engines were in single-engine aircraft, and the average value of the aircraft was $100,000, the economic impact would be 14,000 x $100,000 or $1.4 billion dollars. This figure may be considered an upper bound, however even if the figure were only 10% of that number, $140 million, this is far from "minimal, if any, costs". These costs would be incurred by a large number of individual aircraft owners and small businesses whose aircraft could be forced out of service by obsolete propellers with no available replacement that could meet the proposed noise requirements.

In summary, we strongly believe the rule as proposed in the NRPM must continue to allow the option of approving propeller installations on a no-acoustical-change basis. This policy must also be reiterated in a written form to avoid confusion between applicants and the various certification offices during future certification projects. We strongly believe that continuing the option of a no-acoustical-change finding for propeller installations is in keeping with the spirit of the proposed regulation, would minimize the economic burden on the lowest-priced portion of the GA aircraft fleet and a large number of small businesses and individuals, and is in the best interest of the public.

Sincerely,



Brian E. Meyer
Manager, Aircraft Applications Engineering
Hartzell Propeller Inc

ACE-100

U.S. Department of Transportation
Federal Aviation Administration

Memorandum

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cc: 10
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Subject: INFORMATION: No Acoustical Changes Date: September 14, 1990

From: Director, Office of Environment and Energy, AEE-1 Reply to Attn. of:

To: Manager, Small Airplane Directorate, ACE-100
Manager, Aircraft Engineering Division, AIR-100
Manager, Transport Airplane Directorate, ANM-100
Manager, Rotorcraft Directorate, ASW-100
Manager, Engine and Propeller Directorate, ANE-100

We have recently had a case where an applicant replaced a two-bladed propeller with three-bladed propeller and applied for approval on the basis of no acoustical change. The diameter, tip shape, BHP, and RPM were the same for each propeller.

The applicant's analysis using SAE AIR 1407 showed the three-bladed propeller to be one dB quieter. Our analysis using the Hamilton Standard Method showed the three-bladed propeller to be one dB noisier.

Final resolution was that for BHP's of 400 or below if the diameter, tip shape, blade thickness, BHP, RPM and airplane performance are the same, two-bladed and three-bladed propellers can be interchanged on a no acoustical change basis.

Please be advised that cutting off rounded blade tips with a square cut-off can increase the noise up to four dB.

Richard H. Tedrick
for J. E. Densmore